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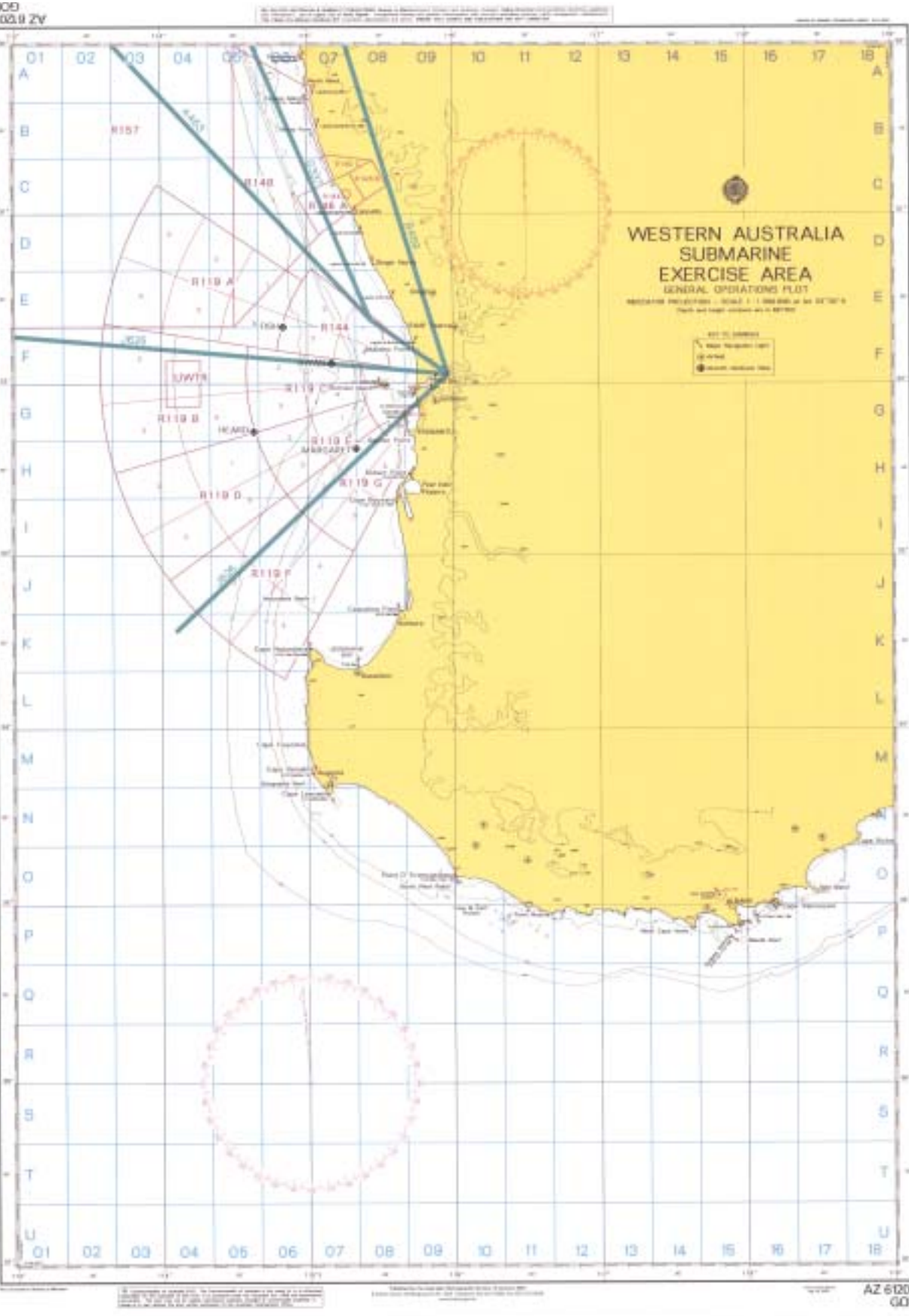


# Whales and the WAXA:

## Australian Defence – Acting to Protect Whales While Supporting Research

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### Geographical and Biophysical Features of the WAXA



The WAXA is characterised by a generally broad continental shelf, with the 100 m isobath occurring at distances of 25 km to 85 km to sea, and the 500 m isobath at distances between about 50 km and 100 km. Near Rottnest Island the shelf narrows and the continental slope rises from the abyssal plain to form a broad subsea valley known variously as the Rottnest Trench, Perth Canyon or Swan Canyon. The Canyon is about 25 km long and 5 km wide at the deepest point. Water depth in the trench rises from more than 1,300 m to less than 180 m. The Canyon is the site of periodic upwelling of plankton rich water.

The WAXA is in a zone of marine biogeographical overlap. Shallow water tropical species of the Northern Australian Region, carried by the Leeuwin Current, and the warm-temperate species of the Southern Australian Region intermingle.

The WAXA, particularly the coastal margins, is traversed by humpback whales (*Megaptera novaeangliae*) on their north-south migrations. The northbound migration commences around May each year, tapering off in July before the southward migration starts. This migration peaks in September, but humpbacks continue to move through the area until November, with cow-calf pairs occurring more frequently in the latter stages. The southern migration is concentrated in shallower waters closer to the coast. Coastal margins of the WAXA may also be used to a limited extent by humpbacks as an area for breeding and resting. The current population of humpbacks using the west Australian migration routes is estimated at around 12,000 to 14,000, with a 10% annual population growth rate. This compares with a just a few hundred when commercial whaling ceased in the early 1960s.

The Swan Canyon has recently been found to be a feeding aggregation area for blue whales, both 'true' blues and the pygmy variety. The Canyon is frequented by pygmy blue whales (*Balaenoptera musculus brevicauda*) over the summer-autumn period (December to May), with anywhere from zero up to possibly 60 or so individuals present in the area at any one time. A small number of 'true' blue whales (*Balaenoptera musculus intermedia*) are believed to occur around the area of the Canyon over the winter-spring period (June to October). The head of the Canyon, where most of the pygmy blue whales are sighted, has been noted as an area where krill are present in large concentrations. It is assessed that blue whales use the area principally for feeding.

A range of other cetacean species, including dolphins, sperm whales and beaked whales also occur in the WAXA.



### Defence Activities in the WAXA

The WAXA is the major military maritime training area on the western seaboard of continental Australia. It has been gazetted for this purpose since World War II and has been used since then for a variety of combat training and military research activities. One of the Royal Australian Navy's largest Fleet bases is located on Garden Island, at the eastern edge of the WAXA. In the three year period of 2000-2002 inclusive, over 24,000 individual unit (i.e. ship, submarine or aircraft) activities were scheduled in the WAXA. The range of ADF activities typically conducted within the WAXA include:

- the use of sonobuoys and ship-mounted and submarine-mounted active and passive sonars;
- ship gunnery and missile shoots;
- aircraft gunnery and missile firings;
- the launch of practice torpedoes from submarines, ships and aircraft;
- the use of pyrotechnics such as parachute flares and smoke floats;
- refuelling of ships while underway;
- low-level flying by fixed wing aircraft and helicopters;
- supersonic flying by fast jets;
- high-speed runs by ships and submarines and general manoeuvring; and
- amphibious landings and helicopter assaults.

The WAXA is used at varying intensities throughout the year. Most activity occurs in the months of January, February, May, October and November, although the WAXA is used year-round. To date there have been no whale strandings associated with Defence activities in the WAXA or any other Australian training area.



## INTRODUCTION

The Western Australia Exercise Area (WAXA), situated near Perth, Western Australia, is one of the primary maritime exercise areas of the Australian Defence Force (ADF). The WAXA extends to a maximum of around 200 km out to sea, and for around 350 km north-south. Total sea area is 67,680 km².

The WAXA is used extensively by ships, submarines and aircraft of the ADF, and shared with merchant shipping, commercial and recreational fishing and whale watching charters. The area straddles the major migration route of the Area IV humpback population and also contains a feeding aggregation area for blue whales. This poster identifies how the Australian Defence Organisation balances essential training with conservation of these marine mammals.



### Defence-Sponsored Whale Research in the WAXA

In recognition of the important whale habitat in the WAXA, Defence has provided financial, technical and material support to a range of research activities. Most of this is focused upon the Perth Canyon and blue whales, encompassing the ecology of the whales and the Canyon's habitat attributes.

Specific components of the current WAXA blue whale research program are:

- aerial surveys;
- small boat surveys and sampling;
- establishment of a photo-identification catalogue;
- collection and analysis of genetic material (sloughed skin) and faecal matter;
- whale tagging and satellite tracking;
- recording and analysis of acoustic signals produced by great whales and fish in the Canyon area;
- recording and analysis of the ambient acoustic environment;
- studies of the physical oceanography of the Canyon; and
- studies of the location, composition and biomass of krill in the Canyon.

Principal participants in the current WAXA blue whale research program are:

- Dr Rob McCauley, Curtin University of Technology
- Dr John Bannister, Western Australian Museum
- Curt and Micheline Jenner, Centre for Whale Research
- Chris Burton, Western Whale Research
- Dr Charitha Pattiaratchi, The University of Western Australia

Support and assistance for the project is also provided by a range of other individuals and organisations including Dr Doug Cato of the Defence Science and Technology Organisation, the Commonwealth Scientific and Industrial Research Organisation, the Australian and Arctic Division, and the US National Marine Fisheries Service Laboratory in La Jolla, California.

Defence consults widely with respect to the current research program and the management of ongoing activities. This includes liaison with both the Commonwealth Department of the Environment and Heritage and the Western Australian Department of Conservation and Land Management, the agencies with shared responsibility for the conservation and protection of whales in the area of the WAXA.

### Environmental Management of Defence Activities in the WAXA

The ADF has a long-established reputation as a responsible environmental steward. This extends to the environmental management of maritime activities. The ADF has established a comprehensive system to properly identify and assess the inherent environmental risks of its maritime activities, and then manage these through a range of risk avoidance and mitigation measures while simultaneously demonstrating legal compliance. Research programs, such as the WAXA blue whale studies support this process.

The central plank of this system is the Environmental Management Plan (EMP) for the conduct of Defence activities in Australia's Maritime Exercise Areas. The EMP provides a range of standard environmental risk mitigation measures employed by all ADF units operating at sea. The first stage of the EMP development process was an exhaustive review of all Defence maritime and amphibious activities and the way in which these may have an impact upon all aspects of the environment, including marine mammals. Although concentrated on the declared maritime practice areas, the measures enunciated in the EMP are employed by ADF ships and aircraft wherever they may be operating.

The central tenet of the EMP is to whenever practicable avoid conducting activities in areas and at times when there is potential for impact upon a sensitive component of the biophysical or socio-economic environment. The EMP considers all elements of the total environment, with a significant proportion of the measures focused upon limiting the risk of acoustic impact upon marine mammals. Sources of underwater noise managed by the EMP include:

- ships (machinery and flow noise);
- aircraft (fixed and rotary-wing);
- gunnery and missile shoots;
- in-water detonation of explosives;
- torpedoes;
- acoustic influence minesweeping;
- underwater acoustic training targets;
- acoustic torpedo decoys;
- marine acoustic signalling devices and transponders; and
- active sonar (all types).

Acoustic propagation conditions for all ADF acoustic emitters were modelled in credible worst-case scenarios (i.e. longest range propagation from source with least acoustic transmission loss) for a range of representative conditions. On the basis of these results and with an underlying conservative approach, a range of standard risk avoidance and reduction measures have been developed, appropriate to the type of equipment and the way in which it is typically operated. These are presented as Planning Guides and Procedure cards. The objective of the Planning Guides is to minimise the risk of environmental impact by spatial and/or temporal separation from potentially sensitive receptors in the first instance, whereas the Procedure cards provide specific guidance to operational units on environmental risks and how these are to be minimised.

The Planning Guides and Procedure cards are used by all ADF units and Defence-support contractors operating at sea. They are subject to continual review and amendment as warranted by new equipment and procedures and new insights and understanding as generated by research such as that undertaken in the WAXA blue whale research program.



### Conclusion

Defence recognises the responsibilities incumbent upon it to conduct its maritime activities in an ecologically sustainable manner. This responsibility is exercised through a range of complementary measures including research programs, risk assessments and adherence to environmental risk reduction measures. The ongoing use of the WAXA by ships and aircraft of the ADF demonstrates that Defence activities and threatened whale species can co-exist in a sustainable manner.



**Australian Government**  
**Department of Defence**